

Name: _____

Math 10F & IPC H.

Date: _____

Chapter 1 Measurement**1.5 Volumes of Right Pyramids and Right Cones***If you double all the dimensions of a pyramid, what does it do to the surface area?**Volume?***Volume of a Right Prism**

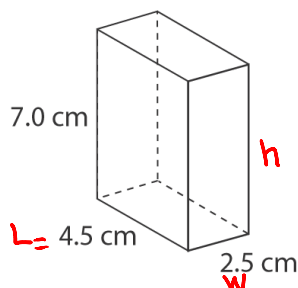
$$V = A_{\text{of base}} \times h$$

Volume of a Cylinder

$$V = A_b \times h \\ = \pi r^2 h$$

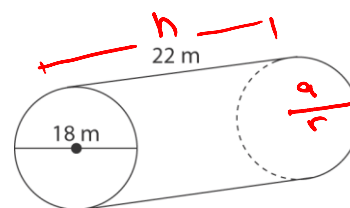
**Determine the volume of the following objects:**

(a) right prism



$$V = A_b \cdot h \\ = L \cdot w \cdot h \\ = (4.5)(2.5)(7.0) \\ = \boxed{78.75 \text{ cm}^3}$$

(b) cylinder

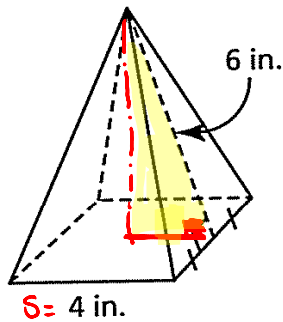


$$V = \pi r^2 h \\ = (3.14)(9)^2(22) \\ = \boxed{5598.32 \text{ m}^3}$$

Constructing Your Understanding

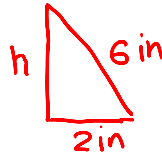
	Prediction	Volume Formula
Right Prism	Volume = (Base Area)(Height)	$V = Ah = L \cdot w \cdot h$
Right Pyramid	$V = \frac{1}{3}(\text{Area of base})(\text{height})$	$V = \frac{1}{3} L \cdot w \cdot h$
Cylinder	Volume = (Area of Circle)(Height)	$V = \pi r^2 h$
Right Cone	$\text{Volume} = \frac{1}{3}(\text{Area of circle})(\text{height})$	$V = \frac{\pi r^2 h}{3}$

Example 1: Calculate the volume of this right square pyramid to the nearest cubic inch.



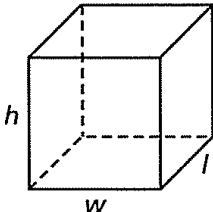
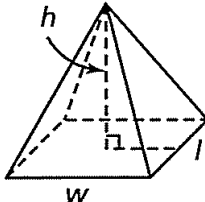
$$V = \frac{S^2 \cdot h}{3}$$

- Find the height of the pyramid



$$h = \sqrt{6^2 - 2^2} = \sqrt{36 - 4} = \sqrt{32} \approx 5.65 \text{ in}$$

$$V = \frac{4^2 \times 5.65}{3} = 30.16 \approx 30 \text{ in}^3$$

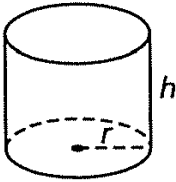
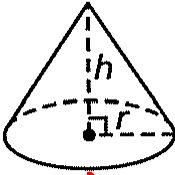
Volume of Right Rectangular Prism	Volume of Right Rectangular Pyramid
 $V = L \cdot w \cdot h$	 $V = \frac{L \cdot w \cdot h}{3}$

Example 2: Determine the volume of a right rectangular pyramid with base dimensions 5.4 cm by 3.2 cm and height 8.1 cm. Answer to the nearest tenth of a cubic centimetre.

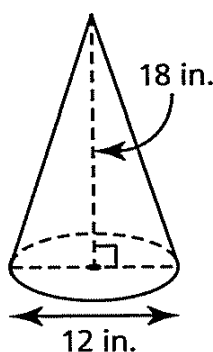
$$\begin{aligned} \text{base} &= 5.4 \times 3.2 \\ h &= 8.1 \end{aligned}$$

$$V = \frac{A_b \cdot h}{3}$$

$$V = \frac{5.4 \times 3.2 \times 8.1}{3} = 46.65 \text{ cm}^3 \approx 46.7 \text{ cm}^3$$

Volume of Right Cylinder	Volume of Right Cone
 $V = \pi r^2 h$	 $V = \frac{\pi r^2 h}{3}$

Example 3: Determine the volume of the cone to the nearest cubic inch.



$$r = \frac{12}{2} = 6$$

$$\begin{aligned}
 V &= \frac{1}{3} (\text{Area of base})(\text{height}) \\
 &= \frac{\pi r^2 h}{3} \\
 &= \frac{(3.14)(6)^2(18)}{3} = 678.58 \\
 &\approx \boxed{679 \text{ in}^3}
 \end{aligned}$$

Example 4: A cone has a height of 4 yd. and a volume of 205 cubic yards. Determine the radius of the base of the cone to the nearest yard.

$$\begin{aligned}
 h &= 4 \text{ yd} \\
 V &= 205 \text{ yd}^3
 \end{aligned}$$

$$3 \times V = \frac{\pi r^2 h}{3} \times 3 \quad \text{isolate } (r)$$

$$\begin{aligned}
 \frac{3V}{\pi h} &= \frac{\pi r^2 h}{\pi h} \\
 \sqrt{\frac{3V}{\pi h}} &= \sqrt{r^2}
 \end{aligned}$$

$$\begin{aligned}
 r &= \sqrt{\frac{3V}{\pi h}} = \sqrt{\frac{3(205)}{3.14(4)}} = \sqrt{48.94} \approx 6.996 \\
 &= \boxed{7 \text{ yd}}
 \end{aligned}$$

Assignment: page. 42 Q #4, 6, 8–12, 15, 16 and 18 + contest#①